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CALIFORNIA OFFICE*
COSTA MESA, CALIFORNIA

Date: May 26, 2000
Docket No.: 0054-0208P-SP

Assistant Commissioner for Patents
Box PATENT APPLICATION
Washington, D.C. 20231

Sir:

Transmitted herewith for filing is the patent application of

Inventor(s): JECHOUX, Bruno

For: METHOD FOR CONTROLLING THE EMISSION POWER OF A TRANSCEIVER IN COMMUNICATION WITH ANOTHER TRANSCEIVER

Enclosed are:

_X_ A specification consisting of 13 pages

_X_ 2 sheet(s) of Formal drawings

_X_ An assignment of the invention (2)

___ Certified copy of Priority Document(s)

_X_ Executed Declaration _X_ Original ___ Photocopy

___ A verified statement to establish small entity status under 37 CFR 1.9 and 37 CFR 1.27

_X_ Preliminary Amendment

___ Information Disclosure Statement, PTO-1449 and reference(s)

___ Other ____

The filing fee has been calculated as shown below:

			LARGE ENTITY			SMALL ENTITY	
FOR	NO. FILED	NO. EXTRA	RATE	FEE		RATE	FEE
BASIC FEE	*********** *********** ***********	********** ********** **********	***** ***** *****	$690.00	or	**** **** ****	$345.00
TOTAL CLAIMS	12 - 20 =	0	x18 =$	0.00	or	x 9 = $	0.00
INDEPENDENT	3 - 3 =	0	x78 =$	0.00	or	x 39 = $	0.00
MULTIPLE DEPENDENT CLAIM PRESENTED	no		+260 = $	0.00	or	+130 = $	0.00
			TOTAL $	690.00		TOTAL $	0.00

_X_ A check in the amount of $ 770.00 to cover the filing fee and recording fee (if applicable) is enclosed.

___ Please charge Deposit Account No. 02-2448 in the amount of $_________. A triplicate copy of this transmittal form is enclosed.

___ No fee is enclosed.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. 1.16 or under 37 C.F.R. 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By______________________

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PATENT
0054-0208P

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicant: JECHOUX, Bruno

Appl. No.: NEW Group: UNKNOWN

Filed: May 26, 2000 Examiner: UNKNOWN

For: METHOD FOR CONTROLLING THE EMISSION POWER OF A TRANSCEIVER IN COMMUNICATION WITH ANOTHER TRANSCEIVER

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, DC 20231

May 26, 2000

Sir:

The following preliminary amendments and remarks are respectfully submitted in connection with the above-identified application.

AMENDMENTS

IN THE CLAIMS:

Please amend the claims as follows:

CLAIM 4: Line 1 and 2, change "one of the preceding claims 1 to 3" to --claim 1--

CLAIM 5: Line 1 and 2, change "one of the preceding claims 1 to 4" to --claim 1--

CLAIM 6: Line 1 and 2, change "one of the preceding claims 1 to 4" to --claim 1--

CLAIM 10: Line 1, change "one of the preceding claims 7 to 9" to --claim 7--

CLAIM 12: Line 1, change "one of the preceding claims 7 to 11" to --claim 7--

REMARKS

The amendment to the claims is to delete multiple dependencies in order to place the application in better form prior to examination.

Entry of the present amendment and favorable action on the above-identified application is respectfully requested.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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0054-0208P

(Rev. 04/19/2000)

CONFIDENTIEL

06948

O/Ref. : 6703

Title : Method for controlling the emission power of a transceiver in communication with another transceiver

Applicant : MITSUBISHI ELECTRIC INFORMATION TECHNOLOGY CENTRE EUROPE B.V

Inventor : JECHOUX Bruno

Filing date : May 27, 1999

Application No : 99 401272.2

The present invention relates to a method for use in controlling the emission power of a transceiver which is in communication with another transceiver, for use for example in a wireless communication system.

Reference will now be made to Fig. 1 of the accompanying drawings which shows a transceiver 10 in communication with another transceiver 20 via a wireless communication system. Transceiver 10 is for example located in a base station and transceiver 20 in a mobile station Data are exchanged between the transceiver 10 and the transceiver 20 via a wireless interface, a so-called radio channel. In Fig. 1, the transceiver 20 receives from the transceiver 10 a radio signal references as RC and sends to the transceiver 10 a radio signal with a power referenced as P. The same is for transceiver 10.

The characteristics of radio channels (for example: phase and amplitude) change continuously, due to variations in the geographical environment between a mobile station and a base station. These variations can be separated into free space

propagation losses, slow fading and fast fading losses. Free space propagation losses depend on the path length between the transmitter and the receiver and can be modelled by a d^{-n} law where n is a number between 2 and 4 and d is the path length. Slow fading losses are due to shadowing occurring when obstacles, such as buildings, trees, etc., are interposed between the transmitter and the receiver. Slow fading losses are known to generate variations in channel power for movements that are in the order of 10 times the wavelength of the radio signal. They can be modelled by a log normal law the standard deviation σ of which ranges between 4 and 12 dB depending on the kind of environment. Finally, fast fading losses are due to multipath effect in which a signal follows different paths and the resulting received signals recombine at the receiver entrance with different delays, amplitudes and phases. They can be modelled by a Rayleigh distribution. Movements that are in the order of 1/100 of the wavelength of the radio signal are sufficient to generate fast fading.

Most telecommunication systems use power control methods to limit interference and power consumption. Power control methods aim to command an emission power of both transceivers as close as possible to the minimum needed for a defined quality of transmission.

Such a method includes, carrying out in an evaluating unit 200 of a transceiver (here the transceiver 20), the steps of measuring the received power of the radio signal *RC* (or its amplitude) and, on basis of the result of this measurement, of evaluating a power control command *PC*. The power control command *PC* is used to command a transmission unit 210 so that it transmits signals with a power *P* corresponding to the command *PC*.

Note that the transceiver 10 comprises also such an evaluating unit and a transmission unit.

Due to the time duration (referenced as t_d in the following description) between the moment of the input amplitude measurement (made in the evaluating unit 200) and the moment of the use of the control command signal *PC* to command the emission power *P* (made in the transmission unit 210), the power control methods are based on a measurement and an evaluation which are made during reception and which are used to determine the power to be transmitted during the next emission.

The value of the time duration t_d is imposed by the system for given periods and thus is known by the considered transceiver.

The emission power P is applied with a certain delay t_d after the measurement has been made by the evaluating unit 200; hence the channel features can have significantly changed between the evaluation and the application of the PC command. The power control command PC then wrongly compensates the channel variations, particularly in the case of fast fading losses, where the stronger the fading is, the quicker it disappears.

The object of the present invention is to overcome the above-mentioned problem and then to propose a method for adaptive power control, which can be used in communication systems wherein the power control delay is longer than the time needed for significant variations in channel features to occur.

To this end, a method for controlling the emission power of a transceiver in communication with another transceiver of a communication system according to the present invention includes the steps of evaluating the fast fading duration and of deducing the power control command from the fast fading duration on basis of the amplitude or the power measurement made by the receiver.

According to another feature of the invention, the method includes, for deducing the power control command, the step of comparing the evaluated fast fading duration with the time duration between the amplitude or the power measurement and the emission power setting, and according to the result of the comparison, in determining said the power control command.

According to another feature of the invention, the method includes the step of setting the control command signal PC at the inverse of the measured amplitude $1/L_m$ if the fast fading duration t_f is higher than the time duration t_d between the amplitude or power measurement and the emission power setting and at the inverse of the short-term average of the measured amplitude $1/L_{av}$ if it is equal to or lower than said time duration :

$$PC(t_d) = \begin{cases} 1/L_m & if\ t_f \succ t_d \\ 1/L_{av} & if\ tf \leq\ t_d \end{cases}$$

The aforementioned features of the invention, as well as others, shall become clearer on reading the following description of an embodiment, said description being made with reference to the attached drawings, in which:

Fig. 1 is a schematic diagram illustrating a communication system provided with a power control system,

Fig. 2 is a block schematic diagram of an evaluating unit of a transceiver in a communication system provided for carrying a method according to the invention, and

Fig. 3 is a graphic illustrating the received amplitude with time for use in explaining the method according the invention.

The method of the invention is applied to a communication system such as the system represented in Fig 1 and is carried out in the evaluating unit of each transceiver 10, 20 of the communication system. Only, the evaluating unit 200 of the transceiver 20 is now considered.

The evaluating unit 200 depicted in more detail in Fig. 2 has a measurement unit 21 for measuring at predetermined times t the amplitude L_m, of the received signal RC, a averaging unit 22 for determining the short-term average L_{av} of the measured amplitude L_m, an estimation unit 23 for estimating the fading duration t_f and a control unit 24 for determining the power control command signal PC which is provided for use by a transmission unit 210 to set the emission power P at the value given by the PC command.

Fig. 3 shows the variations with time of the received amplitude L at the receiver 20 input. Downward arrows indicate measurement times made by the evaluating unit 200 and upward arrows indicate the emission times made by the transmission unit 210. At measurement times, the received amplitude is the measured amplitude and is noted L_m. The dotted line represents the short-term average of the measured amplitude L_m that is then noted as L_{av}. The received amplitude L is representative of the free space fading, of the shadowing fading and of the fast fading. The short time average amplitude L_{av} is representative of only the free space fading and the shadowing fading

Note that the short-term amplitude L_{av} is defined as being the average of the measured amplitude Lm over time periods corresponding to the variation time of the slow fading essentially due to shadowing.

The fading duration t_f is defined as being the average time for which the received amplitude L will stay below the measured amplitude L_m if said measured amplitude L_m is lower than the short-term average amplitude L_{av} or above the measured amplitude L_m if said measured amplitude L_m is higher than the short-term average amplitude L_{av}

In order to optimise the confidence level of the power control, the method according to the invention determines the power control command signal regarding the estimated fading duration t_f derived from the fading depth L/L_{av}. In other words, the power control command value $PC(t_d)$ is equal to the inverse of measured amplitude if the fading duration t_f is longer than the delay t_d between the moment of the amplitude measure made by the evaluating unit 200 and the application of the power control command $PC(t_d)$ to the transmission unit 210 and is equal to the inverse of the average amplitude L_{av} if it is shorter:

$$PC(t_d) = \begin{cases} 1/L_m & if\ t_f \succ t_d \\ 1/L_{av} & if\ tf \leq\ t_d \end{cases}$$

Note that the power control command value $PC(t_d)$ is the value which will be used by the transceiver 20 at the present time + t_d to set the emission power P at the evaluated value $PC(t_d)$.

In Fig. 3, at time t1, the fading time tf is shorter than the time duration t_d. Hence, the power control command $PC(t_d)$ is the inverse of the short term average amplitude $1/L_{av}$. It is the same for the time t3. At time the t2, the fading time t_f is higher than the time duration t_d. Hence the power control command $PC(t_d)$ is the inverse of the measured amplitude $1/L_m$. It is the same is for time t4.

Note that the fading duration is too short to impact upon the emission for cases t1 and t3 but it is long enough to do so for cases t2 and t4.

The method of the invention gives an adaptive amplitude correction able to balance fast fading as well as shadowing and free space losses, since the short-term amplitude average L_{av} correct shadowing and free space channel variations.

Note that the estimation unit 23 needs the value of the speed v of the transceiver 20 relative to the transceiver 10 to evaluate the fading duration t_f. A dedicated unit (not shown) can determine or evaluate and deliver this value.

From a publication of Gans in IEEE Trans. Veh. Technol., Vol VT21, February 19972, pp.27-38, the fast fading duration can be estimated in the following way:

$$t_f = \begin{cases} (a) & \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v}[e^{(\overline{L}^2)} - 1] & if\ \overline{L} \prec 1 \\ (b) & \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v} & if\ \overline{L} \geq 1 \end{cases}$$

where $\overline{L}$ is the measured amplitude L_m at a measurement time normalised by the short-term average amplitude L_{av} ($\overline{L}=L_m/L_{av}$), v and λ are respectively the speed of one transceiver 10 relative to the other 20 and the wavelength of the carrier used by the communication system.

The power control command $PC(t_d)$ can be now given by the following scheme:

$$PC(t_d) = \begin{cases} 1/L_m \begin{cases} if\ \overline{L} \prec 1\ and\ t_d \prec \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v}[e^{(\overline{L}^2)} - 1] \\ if\ \overline{L} \geq 1\ and\ t_d \prec \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v} \end{cases} \\ 1/L_{av} \begin{cases} if\ \overline{L} \prec 1\ and\ t_d \geq \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v}[e^{(\overline{L}^2)} - 1] \\ if\ \overline{L} \geq 1\ and\ t_d \geq \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v} \end{cases} \end{cases}$$

where $PC(t_d)$ is the power control command which will be used at the present time (assumed to be zero) + t_d, L is the received amplitude, L_{av} is the short-term average of the measured amplitude, t_d is the time delay between the moment of the measurement of the received amplitude L_m and the use of the PC command and $\overline{L} = \dfrac{L_m}{L_{av}}$ is the normalised received amplitude.

A simplified equation can easily be derived:

$$PC(t_d) = \begin{cases} 1/L_m & if\ t_d \prec \dfrac{\lambda * \min(\overline{L}, \frac{1}{\overline{L}})}{\sqrt{2\pi}v} \\ 1/L_{av} & if\ t_d \geq \dfrac{\lambda * \min(\overline{L}, \frac{1}{\overline{L}})}{\sqrt{2\pi}v} \end{cases}$$

CLAIMS

1) Method for use in controlling the emission power of a transceiver (20) which is in communication with another transceiver (10) via a communication system, said method including the steps of measuring the amplitude or the power of the signal received by said transceiver (20) and of evaluating a power control command (*PC*) which is then used to command the emission power (*P*) of said transceiver according to said control command signal (*PC*), wherein it includes the steps of evaluating the fast fading duration of the received signal on basis of said amplitude or power measurement and of deducing the power control command (*PC*) from said fast fading duration.

2) Method for use in controlling the emission power according to claim 1, wherein it includes the steps of comparing the evaluated fast fading duration with the time duration between the amplitude or the power measurement and the emission power setting, and in determining said power control command (*PC*) according to the result of said comparison.

3) Method for use in controlling the emission power according to claim 2, wherein it includes the step in setting the power control command (*PC*) at the inverse of the measured amplitude ($1/L_m$) if the fading duration is higher than the time duration between the amplitude or power measurement and the emission power setting and at the inverse of the average of the measured amplitude if it is equal to or lower than said time duration :

$$PC(t_d) = \begin{cases} 1/L_m & if\ t_f \succ t_d \\ 1/L_{av} & if\ tf \leq\ t_d \end{cases}$$

4) Method for use in controlling the emission power according to one of the preceding claims 1 to 3, wherein said fading duration is evaluated by means of the following equation:

$$t_f = \begin{cases} (a) \quad \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v}[e^{(\overline{L}^2)} - 1] & if\ \overline{L} \prec 1 \\ (b) \quad \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v} & if\ \overline{L} \geq 1 \end{cases}$$

where $\overline{L}$ is the received amplitude L_m at a measurement time normalised by the short-term average amplitude L_{av} ($\overline{L}=L_m/L_{av}$), v and λ are respectively the speed of the said transceiver (20) relative to the other transceiver (10) and the wavelength of the carrier used by the communication system.

5) Method for use in controlling the emission power according to one of the preceding claims 1 to 4, wherein said power control command signal (PC) is given by the following scheme :

$$PC(t_d)=\begin{cases} 1/L_m & \begin{cases} \text{if } \overline{L}\prec 1 \text{ and } t_d \prec \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v}[e^{(\overline{L}^2)}-1] \\ \text{if } \overline{L}\geq 1 \text{ and } t_d \prec \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v} \end{cases} \\ 1/L_{av} & \begin{cases} \text{if } \overline{L}\prec 1 \text{ and } t_d \geq \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v}[e^{(\overline{L}^2)}-1] \\ \text{if } \overline{L}\geq 1 \text{ and } t_d \geq \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v} \end{cases} \end{cases}$$

where $PC(t_d)$ is the power control command signal which will be used at the present time (assumed to zero) + t_d, L_m is the measured amplitude, L_{av} is the short-term average of the measured amplitude, t_d is the time delay between the moment of the measurement of the measured amplitude L_m and the use of the PC command and $\overline{L}=\dfrac{L_m}{L_{av}}$ is the normalised measured amplitude.

6) Method for use in controlling the emission power according to one of the preceding claims 1 to 4, wherein said power control command signal (PC) is given by the following scheme :

$$PC(t_d)=\begin{cases} 1/L_m & \text{if } t_d \prec \dfrac{\lambda * \min(\overline{L},\frac{1}{\overline{L}})}{\sqrt{2\pi}v} \\ 1/L_{av} & \text{if } t_d \geq \dfrac{\lambda * \min(\overline{L},\frac{1}{\overline{L}})}{\sqrt{2\pi}v} \end{cases}$$

where $PC(t_d)$ is the power control command which will be used at the present time (assumed to zero) $+ t_d$, L_m is the measured amplitude, L_{av} is the short-term average of the measured amplitude, t_d is the time delay between the moment of the measurement of the measured amplitude L_m and the use of the PC command and $\overline{L}=\frac{L_m}{L_{av}}$ is the normalised measured amplitude.

7) Apparatus in a transceiver (10, 20) in a communication system arranged for use in carrying out the method of one of the preceding claims, said apparatus including an evaluating unit (200) for evaluating a power command (PC) on basis of the signal received by the transceiver (10, 20) and a transmission unit (210) provided to transmit signals with a power (P) corresponding to the power command (PC), wherein the evaluating unit (200) includes an estimation unit (23) for estimating the fast fading duration of the signal received by the transceiver and a control unit (24) for determining the power command (PC) on basis of the fast fading duration estimation made by the unit (23).

8) Apparatus according to claim 7, wherein the control unit (24) is provided to compare the evaluated fast fading duration with the time duration between the amplitude or the power measurement and the emission power setting, and in determining said power control command (PC) according to the result of said comparison.

9) Apparatus according to claim 8, wherein it has a measurement unit (12) for measuring the amplitude or the power of the received signal and averaging unit (22) for determining the short-term average of the measured amplitude or power, the control unit (24) being provided to set the power control command (PC) at the inverse of the measured amplitude ($1/L_m$) if the fading duration is higher than the time duration between the amplitude or power measurement and the emission power setting and at the inverse of the average of the measured amplitude if it is equal to or lower than said time duration :

$$PC(t_d) = \begin{cases} 1/L_m & if\ t_f \succ t_d \\ 1/L_{av} & if\ tf \leq\ t_d \end{cases}$$

10) Apparatus according to one of the preceding claims 7 to 9, wherein the estimation unit (23) is provided to evaluate the fading duration by means of the following equation:

$$t_f = \begin{cases} (a) \quad \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v}[e^{(\overline{L}^2)} - 1] & \text{if } \overline{L} \prec 1 \\ (b) \quad \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v} & \text{if } \overline{L} \geq 1 \end{cases}$$

where $\overline{L}$ is the received amplitude L_m at a measurement time normalised by the short-term average amplitude L_{av} ($\overline{L}=L_m/L_{av}$), v and λ are respectively the speed of the said transceiver (20) relative to the other transceiver (10) and the wavelength of the carrier used by the communication system.

11) Apparatus according to one of the preceding claims, wherein said power control command signal (*PC*) delivered by the control unit (24) is given by the following scheme :

$$PC(t_d) = \begin{cases} 1/L_m \begin{cases} \text{if } \overline{L} \prec 1 \text{ and } t_d \prec \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v}[e^{(\overline{L}^2)} - 1] \\ \text{if } \overline{L} \geq 1 \text{ and } t_d \prec \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v} \end{cases} \\ 1/L_{av} \begin{cases} \text{if } \overline{L} \prec 1 \text{ and } t_d \geq \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v}[e^{(\overline{L}^2)} - 1] \\ \text{if } \overline{L} \geq 1 \text{ and } t_d \geq \dfrac{\lambda}{\sqrt{2\pi}\,\overline{L}v} \end{cases} \end{cases}$$

where $PC(t_d)$ is the power control command signal which will be used at the present time (assumed to zero) + t_d, L_m is the measured amplitude, L_{av} is the short-term average of the measured amplitude, t_d is the time delay between the moment of the measurement of the measured amplitude L_m and the use of the PC command and $\overline{L} = \dfrac{L_m}{L_{av}}$ is the normalised measured amplitude.

12) Apparatus according to one of the preceding claims 7 to 11, wherein said power control command signal (PC) delivered by the control unit (24) is given by the following scheme :

$$PC(t_d) = \begin{cases} 1/L_m & if\ t_d \prec \dfrac{\lambda * \min(\overline{L}, \frac{1}{\overline{L}})}{\sqrt{2\pi v}} \\ 1/L_{av} & if\ t_d \geq \dfrac{\lambda * \min(\overline{L}, \frac{1}{\overline{L}})}{\sqrt{2\pi v}} \end{cases}$$

where $PC(t_d)$ is the power control command which will be used at the present time (assumed to zero) + t_d, L_m is the measured amplitude, L_{av} is the short-term average of the measured amplitude, t_d is the time delay between the moment of the measurement of the measured amplitude L_m and the use of the PC command and $\overline{L} = \frac{L_m}{L_{av}}$ is the normalised measured amplitude.

ABSTRACT

The present invention relates to a method for use in controlling the emission power of a transceiver (20) which is in communication with another transceiver (10) via a communication system, said method including the steps of measuring the amplitude or the power of the signal received by said transceiver (20) and of evaluating a power control command (*PC*) which is then used to command the emission power (*P*) of said transceiver according to said control command signal (*PC*).

According the invention, the method includes the steps of evaluating the fast fading duration of the received signal on basis of said amplitude or power measurement and of deducing the power control command (*PC*) from said fast fading duration

06948

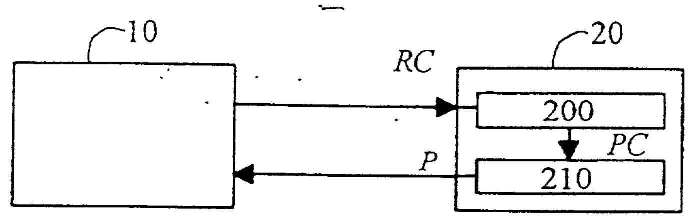

Fig. 1

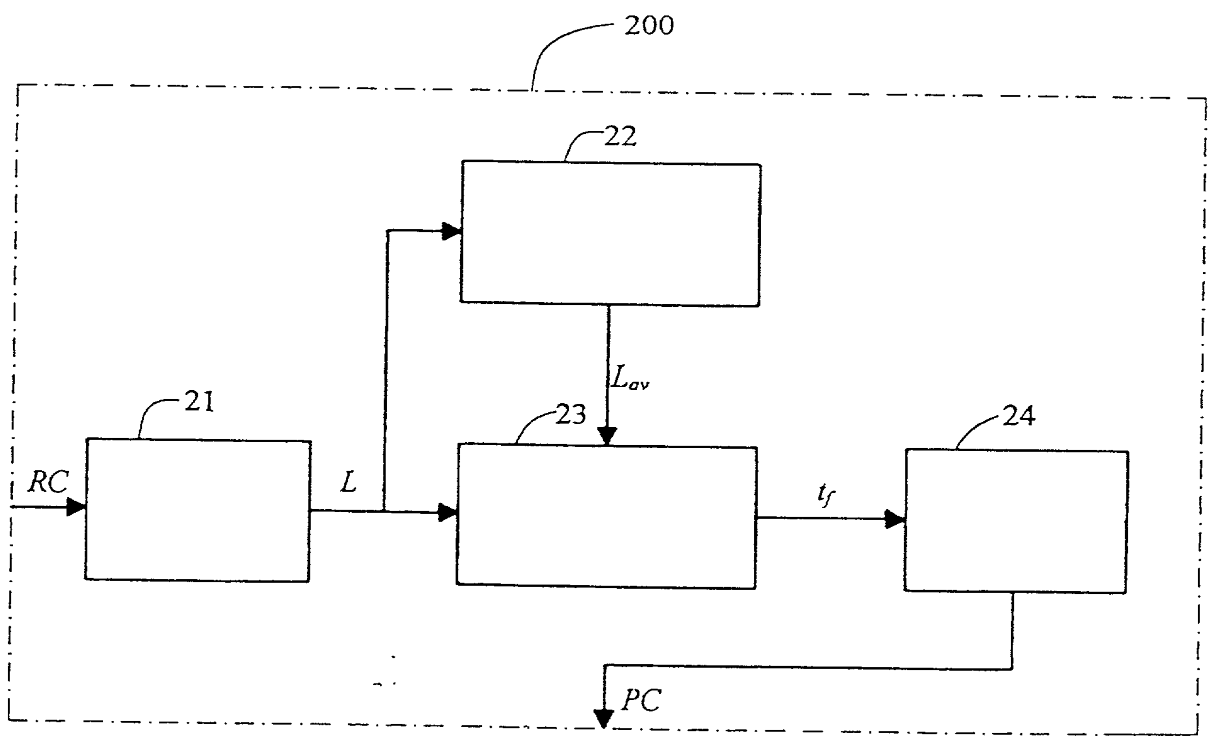

Fig. 2

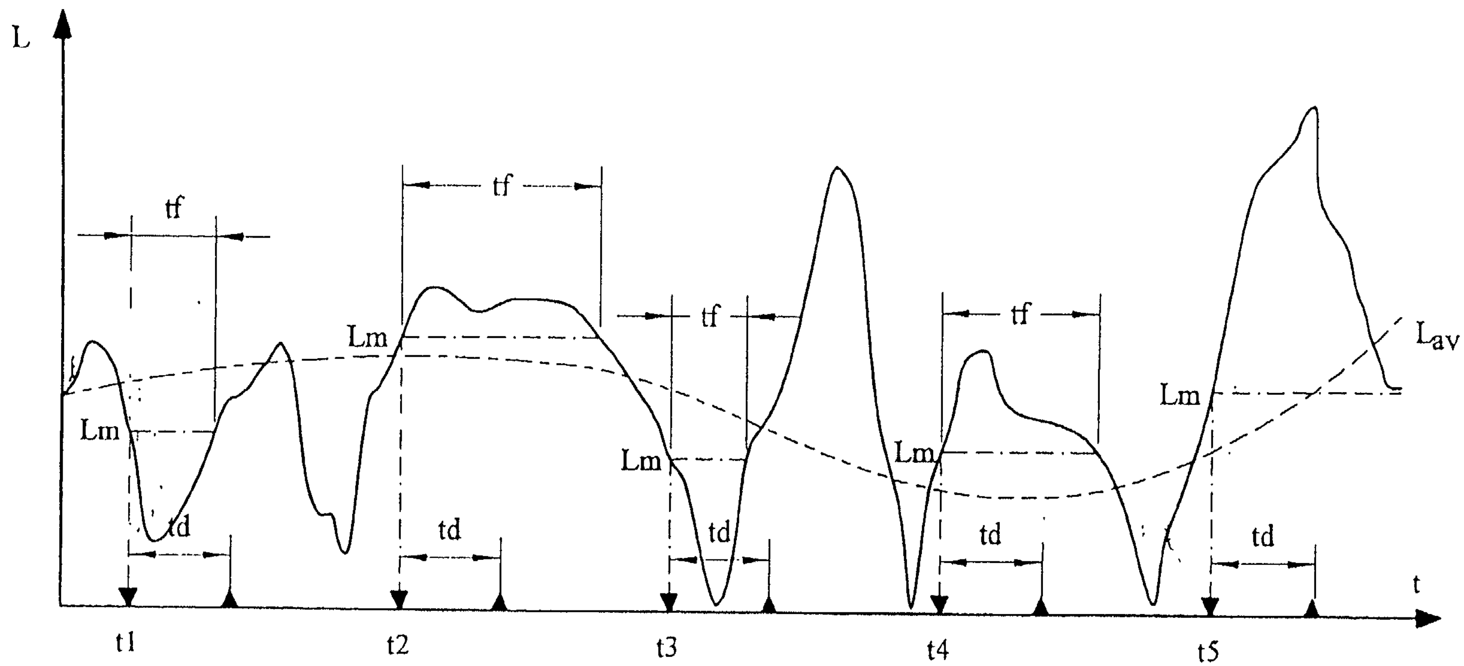

Fig. 3

Declaration and Power of Attorney For Patent Application

特許出願宣言書及び委任状

Japanese Language Declaration

日本語宣言書

下記の氏名の発明者として、私は以下の通り宣言します。

As a below named inventor, I hereby declare that:

私の住所、私書箱、国籍は下記の私の氏名の後に記載された通りです。

My residence, post office address and citizenship are as stated next to my name.

下記の名称の発明に関して請求範囲に記載され、特許出願している発明内容について、私が最初かつ唯一の発明者（下記の氏名が一つの場合）もしくは最初かつ共同発明者（下記の名称が複数の場合）であると信じています。

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled.

METHOD FOR CONTROLLING THE EMISSION POWER OF A TRANSCEIVER IN COMMUNICATION WITH ANOTHER TRANSCEIVER

上記発明の明細書は、
- ☐ 本書に添付されています。
- ☐ ＿＿月＿＿日に提出され、米国出願番号または特許協定条約国際出願番号を＿＿＿＿＿とし、（該当する場合）＿＿＿＿＿に訂正されました。

the specification of which
- ☒ is attached hereto.
- ☐ was filed on ＿＿＿＿＿ as United States Application Number or PCT International Application Number ＿＿＿＿＿ and was amended on ＿＿＿＿＿ (if applicable).

私は、特許請求範囲を含む上記訂正後の明細書を検討し、内容を理解していることをここに表明します。

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第37編第1条56項に定義されるとおり、特許資格の有無について重要な情報を開示する義務があることを認めます。

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

Japanese Language Declaration
(日本語宣言書)

私は、米国法典第35編119条 (a) - (d) 項又は365条 (b) 項に基づき下記の、米国以外の国の少なくとも一ヵ国を指定している特許協力条約365 (a) 項に基づく国際出願、又は外国での特許出願もしくは発明者証の出願についての外国優先権をここに主張するとともに、優先権を主張している、本出願の前に出願された特許または発明者証の外国出願を以下に、枠内をマークすることで、示しています。

I hereby claim foreign priority under Title 35, United States Code, Section 119 (a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)
外国での先行出願

(Number) (番号)	(Country) (国名)	(Day/Month/Year Filed) (出願年月日)	Priority Claimed 優先権主張 Yes はい	No いいえ
99401272.2	Europe	27 / 05 / 1999	☒	☐
			☐	☐

私は、第35編米国法典119条 (e) 項に基づいて下記の米国特許出願規定に記載された権利をここに主張いたします。

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below.

(Application No.) (出願番号)	(Filing Date) (出願日)	(Application No.) (出願番号)	(Filing Date) (出願日)

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(Application No.) (出願番号)	(Filing Date) (出願日)	(Status: Patented, Pending, Abandoned) (現況：特許許可済、係属中、放棄済)

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Japanese Language Declaration
(日本語宣言書)

委任状： 私は下記の発明者として、本出願に関する一切の手続きを米特許商標局に対して遂行する弁理士または代理人として、下記の者を指名いたします。（弁護士、または代理人の氏名及び登録番号を明記のこと）

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